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Building & Highway Material Testing Laboratory

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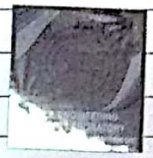
Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Sp_Wa/2018-19 26.04.2018

TEST REEPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements of Asphalting at pipeline attached roads and near Cavery Pump House in Mallasandra Ward No.13, Shettyhalli, Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/219/2017-18 Dated:07.02.2018
* Sample ID	:	Hot mix plant, Bangalore
Technical Reference	:	IS : 2386(Part -3)-1963 (RA-2011)
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	26.04.2018



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2017	2015	2018	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1239	1238	1263	
4	Weight of saturated surface dry aggregate in air	W_3 g	2020	2022	2024	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	781	784	761	
6	Weight of oven dried aggregate	W_4 g	2010	2012	2014	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.574	2.566	2.647	2.595
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.607	2.599	2.682	2.629
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.50%	0.50%	0.50%	0.50%

*Information is furnished by the Customer/Representative.

Comments:

⇒ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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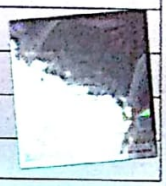
Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2018-19 26.04.2018

TEST REPORT ON BITUMEN CONTENT OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements of Asphalting at pipeline attached roads and near Cavery Pump House in Mallasandra Ward No.13, Shettyhalli, Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/219/2017-18 Dated:07.02.2018
* Sample ID	:	Roads at pipeline attached roads, Ward No.13,
Technical Reference	:	IRC:SP:11-1984
Date of Testing	:	26.04.2018



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	468.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	30	31.50
7. Bitumen content in %	6.00	6.30
8. Average	6.15	

*Information is furnished by the Customer/Representative.

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ಸಹಾಯಕ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಭಿಯಂತರರು
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ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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Job No: CTCE/BBMP/KRIDL/W.No.13/BC/Bitumen/2018-19

26.04.2018

TEST REPORT ON BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements of Asphalting at pipeline attached roads and near Cavery Pump House in Mallasandra Ward No.13, Shettyhalli, Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/219/2017-18 Dated:07.02.2018
* Sample ID	:	Roads at pipeline attached roads, Ward No.13,
Technical Reference	:	IS 2386 and IRC:SP:11-1984
Date of Testing	:	26.04.2018

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	44.2	9.40	9.40	90.60	79-100
9.5	31.25	6.65	16.05	83.95	70-88
4.75	75.21	16.00	32.06	67.94	53-71
2.36	60.25	12.82	44.87	55.13	42-58
1.18	50.12	10.66	55.54	44.46	34-48
0.6	60.14	12.80	68.33	31.67	26-38
0.3	63.25	13.46	81.79	18.21	18-28
0.15	34.15	7.27	89.06	10.94	12-20
0.075	30.25	6.44	95.49	4.51	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	40.25	8.59	8.59	91.41	79-100
9.5	42.15	9.00	17.59	82.41	70-88
4.75	60.21	12.85	30.44	69.56	53-71
2.36	70.25	14.99	45.43	54.57	42-58
1.18	65.24	13.93	59.36	40.64	34-48
0.6	53.21	11.36	70.72	29.28	26-38
0.3	30.14	6.43	77.15	22.85	18-28
0.15	27.52	5.87	83.02	16.98	12-20
0.075	35.62	7.60	90.63	9.37	4-10

Information is furnished by the Customer/Representative.

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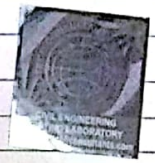
Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Agg/2018-19 26.04.2018

TEST REPORT ON GRADATION OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	:	Improvements of Asphalting at pipeline attached roads and near Cavery Pump House in Mallasandra Ward No.13, Shettyhalli, Sub Division, BBMP, Bangalore.
* Reference	:	BBMP/EE/DD/WO/219/2017-18 Dated:07.02.2018
* Sample ID	:	Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
* Type of Mix	:	Hot mix plant, Bangalore
Date of Testing	:	26.04.2018



Total Weight of Sample: **5150** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per `MORTH 500-18
13.2	765	14.85	14.85	85.15	79 - 100	
9.5	535	10.39	25.24	74.76	70 - 88	
4.75	635	12.33	37.57	62.43	53 - 71	
2.36	515	10.00	47.57	52.43	42 - 58	
1.18	510	9.90	57.48	42.52	34 - 48	
0.600	545	10.58	68.06	31.94	26 - 38	
0.300	580	11.26	79.32	20.68	18 - 28	
0.150	340	6.60	85.92	14.08	12 - 20	
0.075	315	6.12	92.04	7.96	4 - 10	

Total Weight of Sample: **5200** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	645	12.40	12.40	87.60	79 - 100	
9.5	550	10.58	22.98	77.02	70 - 88	
4.75	680	13.08	36.06	63.94	53 - 71	
2.36	545	10.48	46.54	53.46	42 - 58	
1.18	635	12.21	58.75	41.25	34 - 48	
0.600	480	9.23	67.98	32.02	26 - 38	
0.300	540	10.38	78.37	21.63	18 - 28	
0.150	385	7.40	85.77	14.23	12 - 20	
0.075	510	9.81	95.58	4.42	4 - 10	

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Job No.: CTCE/BBMP/KRIDL/W.No.13/BC/Stability/2018-19 26.04.2018

TEST REPORT ON MARSHALL STABILITY OF MIX

* Customer	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP Bangalore.
* Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
*Name of the Work	:	Improvements of Asphalting at pipeline attached roads and near Cavery Pump House in Mallasandra Ward No.13, Shettyhalli, Sub Division, BBMP, Bangalore.
*Reference	:	BBMP/EE/DD/WO/219/2017-18 Dated:07.02.2018
* Source	:	Hot mix Plant, Bangalore
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	26.04.2018

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability (Kn at 60°C)	9.35	9.25	9 Kn (min)
2	Marshall flow (mm)	2.05	3.30	2 – 4
3	Voids in Compacted Mix %	3.65	5.20	3 – 6
4	Percent voids in Mineral Aggregate (VMA)	13.50	14.60	13 - 15
5	Percent Voids filled with Bitumen (VFB)	66.15	69.25	65 - 75
6	Density, g/cc	2.26	2.27	--

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